

The Citrus Industry

THE ONLY PUBLICATION IN THE WORLD
DEVOTED EXCLUSIVELY TO CITRUS FRUIT

Issued Monthly
Representative of every interest—
Representing all special interests.

RECEIVED
VOL. 1 SEPTEMBER, 1920 NO. 9

FED 1920

Some of the important citrus troubles are shown on the Grapefruit leaf used as our trade mark.
At left is the adult White Fly, next the Root Mite, near the tip the Purple Scale, and in upper
middle the disease known as Scab of Grapefruit. All but Scab are shown more or less enlarged.



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You cannot know without investigation. Therefore investigate. You will find that the entire directorate, with one exception, is made up of Texans; bankers, professional men, business men and oil men. Judge Gaines B. Turner, President of the Company, was one time a member of the Texas Legislature and for 23 years was a prominent lawyer of Ft. Worth, Longview and Breckenridge, Texas. He amassed a fortune in his legal practice and is considered one of the best traders in the oil business today. Judge James W. Swayne, Vice-President, is perhaps the best known oil man in the south. He was founder of the Hog-Swayne syndicate, the parent organization of the great Texas Company. He was the first president of the Texas Co. There are three Texas bankers on the Board of Directors: T. C. Morgan, ex-president of the First National Bank of Longview; J. Roy Knox, President of the Riddle Exchange

Bank of Gladewater; and W. E. Buckman, vice-president of the Breckenridge State Bank & Trust Company of Breckenridge, Texas. If you should desire to investigate the personnel of the Company you may refer to:

REFERENCES:

Farmers & Mechanics National Bank,
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Continental Bank of Commerce,
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First National Bank, Longview, Tex.
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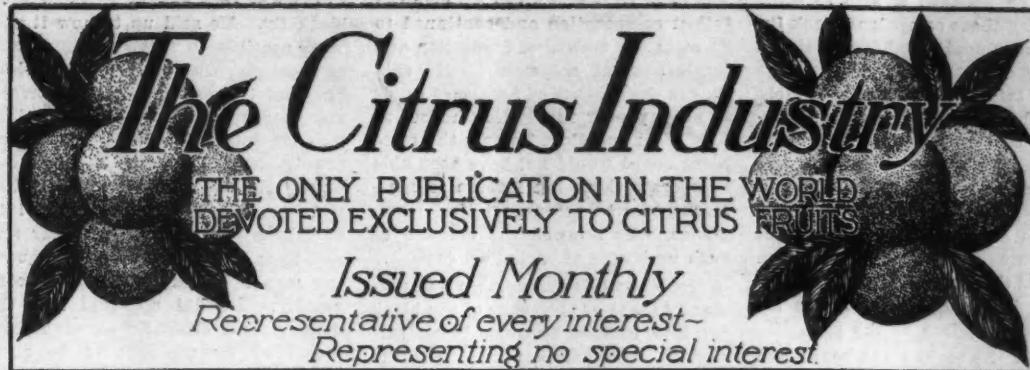
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Before I bought this stock myself I personally investigated.—Geo. Terryberry



Vol. 1

SEPTEMBER, 1920

No. 9

Florida to Guard Against West Indian Black fly

The agitation for protection of Florida citrus groves against the black fly of Cuba and West Indian islands, which recently was originated by Dr. P. Phillips of Orlando, resulted in a large meeting of citrus interests at Orlando on the afternoon of September 9th.

The meeting was called by the citrus committee of the Orlando Board of Trade, of which B. F. Floyd is chairman. This committee issued invitations to representative growers and others in various portions of the state, offering its offices to hold the meeting, and the invitation met with hearty response. The gathering was held at the Orange county court house and was called to order by W. L. Tilden, president of the Orlando Board of Trade, who briefly stated its objects and introduced Judge John M. Cheney of Orlando, who welcomed those present. In his remarks Judge Cheney reminded the growers that canker, white fly, red spider, scale and other citrus pests in Florida had gotten their start from very small beginnings. He also mentioned water hyacinths as an illustration of what may come from a very small beginning in plant work.

In opening the meeting, President Tilden stated it as his opinion that the quarantine regulations at present in force, while excellent, were inadequate to guard against the various menaces to the Florida citrus industry.

B. F. Floyd, of Orlando and Jacksonville, was selected as permanent chairman of the meeting, and Benja-

min Cox, secretary of the Orlando Board of Trade, was named its secretary.

Mr. Floyd gave it as his opinion that the time had come when it was absolutely necessary to strengthen the weak points in the defenses already established by the Florida State Plant Board and said the time had come when only the full co-operation of the federal horticultural board could accomplish some of the things it now was necessary to do. He called upon Wilmon Newell, State Plant Commissioner, to give the meeting the benefit of his information upon the subject of the black fly and his opinion as to what menace it held to Florida.

Mr. Newell said the black fly, which already has become most firmly established in Cuba and in Nassau, really was to be dreaded as greatly by Florida's citrus men as was citrus canker. For one thing, he stated that the black fly through its ability to travel did not depend upon other agencies to spread its field once it got a start in a given section. He said the black fly constitutes a comparatively new danger not only to citrus growers, but to others, in that it attacks not only citrus but other fruit and ornamental trees and shrubs. He said the first official record in Florida of the black fly came in 1916 through a report from Mr. Sasser, who stated that in the vicinity of Nassau it was proving most injurious to guavas. In the winter of 1916, Dr. J. H. Montgomery, inspector for the state plant board, was

sent to Nassau in connection with certain citrus canker researches. He found no canker in this portion of the Bahamas, but found the depredations of the black fly already to have been tremendous there. Even then grapefruit growers on New Providence island in many instances had cut down their trees because of their having been ruined through the activities of this pest.

Rule 26 of the state plant board requiring quarantine inspection of plants coming from countries infected with the black fly came as a result of Dr. Montgomery's report. It was found black fly even then was not confined to the Bahama Islands, but was most active also in Cuba. Mr. Newell then made a trip to Havana and looked over the situation there. He found the black fly had spread over a considerable portion of the island. While mangoes and limes were most susceptible to this pest, its activities were not by any means confined to them. Even in 1916 many lime trees near Havana were seen to be dying as the effects of the black fly and its larvae.

Mr. Newell stated the Cuban government has attempted two campaigns of eradication against this pest, for the first of which an appropriation of \$70,000 was made and later \$130,000 was appropriated and spent for the same purpose. The attempts at eradication and control were through sprays of whale oil soap and kerosene solutions. However, Mr. Newell stated these campaigns were entirely unsuccessful.

THE CITRUS INDUSTRY

He said he believed it safe to state that during these campaigns black fly had not been eradicated from a single property, except in instances where the trees infected had been absolutely destroyed. He said the Cuban government still was maintaining some slight effort to fight this pest, but that on his latest visit to Cuba he had found black fly to infest even plants and trees in the Cuban Agricultural Experiment Station. The western portion of the island and Orente province, he declared, however, thus far had been kept free of the pest.

He said the state plant board had long been awake to the dangers to Florida from black fly and the matter had been mentioned a number of times at growers' meetings and discussed at the citrus seminar, but up to this time small attention had been paid to the warnings given by himself and associates. He said that Rule 26 excluded the entry into Florida of plants, leaves and foliage of all kinds coming from black fly infested countries, but it had not been practicable to exclude fruits themselves.

He stated the state plant board had continuously maintained inspection at the ports of Miami, Key West and Tampa, and that all shipments were carefully inspected at these ports. He said that in addition to shipments of fruit and other things from Cuba intended solely for transportation through the state of Florida, that there were shipments of mangoes, avocados and limes from Cuba going practically to all portions of Florida. While other shipments were inspected to guard against the importation of foliage and leaves, he said that shipments of fruit intended for consumption in Florida were fumigated by the state plant board men. For this purpose fumigation was had by hydrocyanic acid gas which had proved most successful in this work. All shipments of fruits or other commodities containing leaves and foliage, he said, were denied entry into Florida, as are cut flowers from Cuba and the West Indies. In this work, he said, the state plant board men had the closest co-operation of the treasury department of the United States, which offered them every facility in the stoppage of such shipments. However, he declared, that up to now it had not been possible to obtain any measure of relief from the United States department of agriculture, or any other department of the United States government other than the treasury department. He said that the transporta-

tion companies had given his men the fullest co-operation and continued to do so in the matter of inspection and fumigation of shipments. He said that in the absence of necessary funds to erect proper fumigation houses at Key West and Port Tampa, the state plant board would not have been able to operate these but for the co-operation of the transportation companies, who allowed the erection of such buildings at their own cost.

Mr. Newell declared there was constant danger of the entry of the black fly into Florida through being carried on fruits and plants brought into the state by boat and railroad passengers. He cited a New York man who had come in by way of Key West carrying a bunch of limes which had been found to be heavily infested with black fly. He said therefore it was necessary to maintain the closest inspection over the baggage of those entering the state from Cuba and the islands and that in this the customs officials gave the local men very practical co-operation.

He said formerly it was an almost universal practice for Cuban firms to include sweet potato vines and banana leaves as packing in ends of barrels of fruit consigned to Florida, but after repeatedly returning such shipments to the owners this practice finally had been stopped with the Cuban government co-operating to forbid the practice.

Mr. Newell stated that there was some danger of black fly gaining admission into Florida through adult shipments coming in the holds of ships, but that contrary to the impression which seemed recently to prevail in the state, he and his associates felt one of the greatest sources of danger was through the operation of the car ferries between Havana and Key West. He said that through these there seemed to be perhaps the best chance for adult flies to obtain entrance into Florida and the Gulf states, through escape from cars used in shipments for consumption in Florida or the Gulf states or by escape through open ventilators of cars destined for northern points. Mr. Newell described how cars are set for loading on the island of Cuba, back among the groves and cane fields, and that when loaded and closed they are carried over the Cuban railroads and the car ferries through Key West directly into Florida.

He told of finding an American railway box car standing on a Cuban siding with the doors wide open within six feet of a seedling orange tree

which was very heavily infested with black fly. He said up to now it had been possible to fumigate such cars as were for distribution in Florida, but that the amount of funds available had not permitted the fumigation of interstate shipments which simply were passing through the state. He said approximately 15,000 freight cars a year are coming into Florida from Cuba over the car ferries from Havana and that this quantity could be expected to increase rapidly. He did not feel that the danger from black fly through shipments by steamer should be overlooked, but said it was felt that the closest watch perhaps should be kept on those shipments coming in over the car ferries.

Mr. Newell stated that it was not practical, regardless of the danger, for the state plant board to prohibit shipments of Cuban fruit or other articles into the state of Florida, or through the state of Florida, because such movement not only was interstate, but international commerce as well, and that state authorities could not very well interfere in such a matter beyond a certain point. He also said that Florida was not alone threatened by the black fly, but once gaining entrance, could flourish in other Gulf states, and that the possibility of black fly gaining entrance into the United States was just as great through Mobile, New Orleans, Galveston or Brunswick as through Florida ports. Therefore, the federal government should take a hand in the matter.

He stated that members of the state plant board had several times brought this matter to the attention of the federal horticultural board, but without effect. He gave it as his opinion that he rather felt the federal horticultural board members might believe the Florida men cranks on this subject, but if shown that growers and citrus interests back them up in their conclusions he believed the federal horticultural board would take a hand.

Dr. J. H. Montgomery, quarantine inspector for the state plant board, was the next speaker introduced by Chairman Floyd. He said the information given by Mr. Newell had been very complete and he felt he properly could add only a few details. He said the danger through the car ferries at Key West was hard to exaggerate. He said there were two large ferries at present in operation, each carrying 30 freight cars at a trip, and that a third ferry might be expected to be in operation

THE CITRUS INDUSTRY

5

in a short time. That there had been a big increase in Cuban business via this port and perhaps it was not too much to expect within a relatively short time that there would be a total annual movement via the car ferries of 25,000 to 30,000 cars. Added to this, he said, the steamship facilities were bound to be increased and it should be remembered that each passenger was a potential carrier of black fly.

Of ten specimens of black fly recently arrested at Florida ports by representatives of the state plant board, five were in freight shipments and five were in the baggage of passengers.

Dr. Montgomery said black fly also was to be found in Jamaica, the Canal Zone and in Costa Rica and that the most careful inspection should be had of shipments from all West Indian and Central American territory. He agreed with Mr. Newell that an embargo against shipments of fruit from these countries was impractical and gave it as his opinion that only most thorough inspections with fumigation could protect against the entrance of this pest.

He said the federal horticultural board had the authority to designate certain ports for the entrance of shipments which it is intended to inspect and fumigate. In this way shipments may be directed solely through ports where provision is made for proper inspection and fumigation. In reply to a question from Dr. O. W. Sadler of Mt. Dora, Dr. Montgomery stated that hydrocyanic acid gas fumigation killed the black fly and its larvae in boxes of fruit without the necessity for unwrapping or opening the shipments. He stated the mixture used was in the proportion of 2 ounces per 100 cubic feet and had been found entirely effective.

He said inspectors of the state plant board estimated that about 5,000 boats entered the various ports of Florida every year. Of these about one-half are from foreign countries. Of boats from Cuba and West Indian points about 1,100 yearly came to Key West, 500 to Tampa and 500 to Miami. Dr. Montgomery gave it as his opinion that not only were the citrus growers interested in barring the black fly, but that all other growers of fruits and vegetables were interested with them, for in Cuba and other places the black fly had included in its depredations every sort of tree and ornamental plant, even the hibiscus and jessamine.

At the conclusion of Dr. Montgomery's remarks, Chairman Floyd announced the appointment of a committee on resolutions, consisting of M. G. Campbell of Lake Wales, Geo. E. Merrick of Miami and L. P. Dickie of Tampa. While the committee retired the chairman introduced W. J. Krome of Homestead, widely known citrus and avocado grower and director of the Florida Citrus Exchange from Dade county.

Mr. Krome said he had been familiar with the black fly menace since the time of Dr. Montgomery's first report following his visit to the Bahamas. In Cuba several times, Mr. Krome said, he personally had an opportunity to witness the depredations wrought by this pest. However, he had not been in Cuba within two years and he understood the situation had become worse rather than better since the time of his last visit. He said, in his humble opinion, the black fly was perhaps the most serious of all insect pests and that the statement earlier given to the meeting by Mr. Newell must be considered an understatement rather than overestimate of the menace. He said that in the Bahamas where the black fly had gotten hold, the citrus industry either had been ruined or made entirely unprofitable.

In addition to the sources of possible admission of black fly as made by Mr. Newell and Dr. Montgomery, Mr. Krome called attention to the possibilities of admission through being carried on small boats and yachts which practically every winter come to the Florida coasts from the Bahamas in great numbers; also through the air service which has been inaugurated between two of the Bahama Islands and Miami. Mr. Krome mentioned another possible menace in the double-loaded cars of pineapples coming from Cuba, which are said to carry about double the normal loading in order to economize space in the car ferries, and which are rehandled and reloaded at Key West to reduce the loads to normal for travel over the railroads of the United States. Mr. Krome said the menace through the use of American railroad cars in Cuba for loading shipments destined to the United States was very great, as Cuban concerns often were very dilatory in loading such cars; that in some instances the cars stood on small sidings in the vicinity of groves or cane fields literally for weeks or months.

Mr. Krome said that an embargo against Cuban grapefruit or other fruits and vegetables would not

eliminate the danger, as every other commodity loaded in Cuba for the United States in the original cars maintained a source of danger for black fly which might well gain entrance into these cars while empty and make escape through ventilators or in other ways into Florida. He said that in the event of an interruption of traffic through strike or other cause which would hold north-bound cars from Cuba on the sidings of Florida railroads, perhaps alongside orange groves, it would constitute a very great menace.

At the conclusion of Mr. Krome's talk, Judge A. G. Hamlin of Deland asked Mr. Newell whether or not the range of the black fly was approximately the same as that of the white fly. Mr. Newell replied to the effect that the habits of the two pests seemed much the same and while no definite test had been made he would assume that the range of travel of the black fly was approximately the same as the white fly.

Dr. P. Phillips of Orlando next was introduced. Dr. Phillips said he believed he might be regarded as the original agitator against the menace of black fly in this particular instance and that he felt strongly that all possible steps should be taken and as promptly as possible. Dr. Phillips recited certain of his experiences with California laws during the past year and said that it was up to the growers of Florida to obtain passage by the legislature of laws for Florida which would give them the same degree of protection against pests from outside the state as already was enjoyed by the California growers. Dr. Phillips said it was distinctly up to the growers of Florida to protect their own interests and not to look to others to do it for them. He said he would like to see the meeting result in action toward that end.

John S. Taylor of Largo was introduced and said to his mind the problem confronting the growers of regulations to keep out the black fly was no simple one because of the interstate commerce involved. He said while it was true California growers were protected against shipments into California, still Florida growers could and did ship Florida fruits right through California in interstate commerce. He said he believed the only remedy practical against the entrance of black fly was proper quarantine and inspection at all ports, with fumigation of all shipments entered. He declared himself in favor of a sufficient appropriation

(Continued on Page 16)

THE CITRUS INDUSTRY

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FLORIDA CITRUS OUTLOOK

DURING the present month there has been a world of speculation as to the probable size of the Florida citrus crop. Published estimates, many of them later disclaimed, have varied from an increase of 25 per cent over last year's production, to a decrease of a similar percentage from the 1919 crop.

The Citrus Industry has been to considerable pains to secure the views of the best posted citrus men in the state. Growers, packers and shippers from Ocala to Fort Myers, from Palatka to Miami, have been asked to submit their estimates together with reports of local conditions in the several sections of the citrus belt. These estimates have been carefully compared and the reports of local conditions have been closely studied.

As a result of this composite view of the situation, as obtained from widely scattered sections and from men in close touch with the situation, The Citrus Industry is convinced that the total production of citrus in the state this year will be materially under the total of the 1919 crop.

The consensus of opinion as gathered by this publication, appears to be that the orange production will be fully equal to, or a little heavier than the crop of last year. It is generally conceded that grapefruit production will be materially less, the estimates on this crop ranging from a loss of 25 per cent as compared with last year to a shortage of fully 40 per cent as compared with the 1919 yield. If these estimates are even approximately correct, the total citrus crop of the state will be less by far than the 1919 crop, for any increased yield of oranges must be more than offset by the decreased yield of grapefruit.

Official reports place the shipments from Florida for the crop of 1919 at 12,495,925 boxes of all citrus fruits. As estimates now being made are based upon present condition and do not take into consideration the effect of the November drop, it is safe to conclude that the present crop will be materially less than the figures given for the crop of last year. Even should there be only a normal droppage of fruit in November, the crop probably would be a half million boxes under the total for the crop of 1919. With an abnormal droppage during November, this decrease might easily become a million boxes less than last year.

On the other hand, thousands of acres of new groves will this year bear their first marketable crop, and this will in a measure tend to swell the total production for

the year, but even with this increased acreage, it would be too much to expect a total equal to the crop of 1919, as the new acreage will of necessity afford but a small yield per tree.

From a careful study of the situation and a comparison of the various estimates from widely diversified sections and interests, The Citrus Industry is inclined to the belief that a 12,000,000 box yield may be accepted as the very maximum, while an exceptional droppage in November might easily reduce the production to an even greater extent.

With anything like normal conditions in transportation and with a normal demand in market centers, a fair price for oranges is anticipated, while the great reduction in the production of grapefruit should go far toward insuring better prices for this fruit than prevailed last season, particularly should the sugar situation continue to improve.

THE TRANSPORTATION SITUATION

THE TRANSPORTATION problem is one which always concerns the shippers of citrus fruits, along with the shippers of other perishable products, and the near approach of the present citrus shipping season is no exception to the general rule. But, while citrus shippers are always somewhat apprehensive as to the ability of the transportation companies to supply sufficient cars, there is at least one note of encouragement in the present situation which would seem to indicate that an improvement in transportation facilities may be anticipated.

During and since the war, the railroads have been handicapped by the great demand for skilled labor in other lines of industry which absorbed a large percentage of former railroad mechanics. Under these conditions, it became practically impossible for manufacturers of cars and locomotives to secure anything like an adequate supply of skilled mechanics to meet the growing demand for new rolling stock. Production in these lines was almost at a standstill. Railroads were operating with inadequate equipment and with no apparent hope of securing additions. Locomotives and cars which should have been sent to the repair shops or the junk heap were kept in service in the hope of meeting the ever increasing demand for movement of freight. This meant not only a shortage in equipment, but decreased efficiency in handling.

But now there appears to be a hope at least that these conditions may undergo improvement. Lessened production in certain other industries, notably in the manufacture of automobiles, has had a tendency not only to release cars formerly used in the transportation of these products, but also in releasing thousands of skilled mechanics from other industries who now are seeking employment with car factories and locomotive works and in the operating departments of the railroads. While this increased supply of skilled labor available for work in transportation industries has so far been limited, it has had a tendency to relieve somewhat a very aggravated situation. It is the belief of many that the additions to the working force of industries connected with the operation of transportation lines will be still further augmented as the season advances, and that new cars and locomotives will be delivered to the railroads in increasing quantities.

Should this view of the transportation situation prove to be correct, the citrus shipper will be relieved of one of the worst handicaps with which he has had to deal in recent years—that of getting his fruit to central

markets at the time when the demand is greatest and the price the highest.

While experience has taught the citrus shippers to beware of over-optimism in regard to transportation problems, there is noted a general feeling of confidence that the near future holds out at least the hope of improvement over conditions which have prevailed since and during the war period.

TRAILERS FOR FARM HAULING

HOW MANY small grove owners have considered the possibilities of the automobile trailer? On many small groves there is not enough hauling to justify the purchase of a heavy truck, yet there is probably not a grove that supports an automobile where a trailer would not be found convenient occasionally. There are many occasions when quick trips with light loads are necessary. Here is where the trailer earns its "keep."

A Michigan farm paper is reported to have made a survey of 21 farmers who use trailers with passenger automobiles. The information obtained has been summarized by an organization of trailer manufacturers. The farmers were widely separated and resided in 10 different counties of the state. The trailers were of the two-wheel type which carry from 800 to 2,000 pounds. The haul to market ranges from two to 36 miles and an average of about 18 miles. All kinds of roads were negotiated and the farms were from 40 to 480 acres.

The type of hauling to which the trailers are adapted is indicated by the products which these farmers transported. They included live stock, poultry, produce, vegetables, fruit, seeds, groceries, lime, feed, cement, tools, implements, and other commodities. Fifteen of the farmers said the trailer did not harm the cars, three were doubtful and one was of the opinion it may do some damage to the car. Three of them had used their trailers six years; two, five years; eleven, four years; and three, three years. The upkeep varied from \$2 to \$20 a year.

Probably the greatest advantage of the trailer is expressed by those among whom the survey was made. Products which can be delivered by trailer reach the market in better condition and in shorter time than by wagon. For the farmer who has considerable light hauling and who owns an automobile, the trailer offers possibilities. It can be used for going to market when otherwise it would be necessary to take a team from the field to make the trip to town.

Trailers are especially adapted to the needs of the small grove owner and the combination truck and grove farmer, and wherever an automobile is found upon the grove or farm it should be supplemented by the trailer.

Secretary Willis B. Powell, of the Lake County Chamber of Commerce, suggests that commercial organizations and business men should emphasize in their publicity the opportunities for securing congenial work in Florida. The advertising pages of Florida and California newspapers show a very great contrast in conditions as our papers contain many advertisements for experienced help of all kinds; while in California the advertisements are principally of people wanting positions. A great many people in other states are planning to spend the coming season either in Florida or California. No doubt a very large proportion of them can be secured for Florida if this matter is brought to their attention; and at the same time they will be a big help in supplying our need for experienced artisans, mechanics and professional men.

"See Florida first" is recommended to our own people who have opportunity for taking a vacation. The autumn months are unexcelled for touring the state. There are thousands of people in Florida who are not acquainted with any part of their state outside of their own little community. We recommend that they take their families for a pleasure trip, and see what other parts of the state are doing in development work and road construction, at the same time getting acquainted with the business men in sections visited, in order to better understand the opportunities and advantages in this state.

The Southern fish and oystermen recently held a meeting at Mobile for the purpose of organizing an association to become affiliated with the National Fish and Oystermen's Association. Just another straw showing the tendency of every industry to achieve national organization. When will the citrus men join the movement?

There is growing evidence that premature shipments of citrus fruits from Florida this year will be discouraged by growers and shippers generally. This is as it should be. Florida in the past has suffered much from the shipment of immature fruit, and it is to be hoped that the present season will see no repetition of the error.

The meeting of Florida citrus men at Orlando on September 9 to devise ways and means of preventing the importation of black fly into the state, demonstrates that citrus men can and will get together when a common enemy threatens a common interest.

D. W. Hadsell struck the keynote in citrus production in his article in The Citrus Industry last month, when he said: "It is not the number of acres in the grove, but the amount of fruit per tree, which makes for profit or loss to the grower." That is the lesson which every citrus grower should learn.

The producer who kicks against the business man who makes a profit should remember that even a co-operative organization of producers would go out of business if it did not make a profit for its members. Profit—legitimate profit—is the mainspring of all industry.

J. G. Grossenbacher has an excellent article on "Die-back" and its treatment in this issue. Mr. Grossenbacher is recognized as an authority on diseases of citrus fruits and any article from his pen will be read with interest by citrus growers.

Wouldn't it be a fine thing—right now—if we had a national organization of citrus men to take a hand in solving the problem of keeping the black fly not only out of Florida but out of the United States?

Last season it was the shortage of sugar which tended to "bear" the price and curtail the consumption of grapefruit. This season it promises to be the increased freight rates.

It doesn't cost much to maintain a colony of bees. They extract honey from your orange blossoms and store it up for your pleasure and profit.

Only a little of the earliest grapefruit from extreme southern points will be shipped from Florida before October 1.

Dieback of Citrus Trees

By J. G. Grossenbacher, Florida Insecticide Co., Apopka, Fla.

Description of Diseased Trees

Dieback is a disease of citrus trees and fruits that is very common in Florida groves. The characters that seem to be responsible for the name are most often found on trees that are less than ten years old. In most severe cases the young shoots die back from a few inches to a foot or more, while the inner foliage and twigs of the trees are retained. Figure 1 shows the bristling dead shoots of such a tree. It is well to remember, however, that not all trees showing dead shoots have dieback. The difference is usually apparent on inspection, for dieback trees that reached the dead-twig stage show many peculiarities that easily identify them. Dieback trees that have reached that stage of development of the disease usually also have many living twigs with gummy streaks and patches as well as shoots with clusters of crowded buds in place of the ones characteristic of normal shoots, as shown in Figure 3. Many living shoots show enlargements at or near the points where leaves arise. When cut across these swellings are found to be blisters; the bark having been forced away from the wood by the accumulation of gum. On some twigs there is a brownish outgrowth in spots or streaks that is rough and often gummy in appearance. Many of the branches droop and have their ends turned upward. The mild or early stages of the disease are characterized more often by drooping branches, gum blisters and the shedding of immature foliage. Even before there is shedding of leaves dieback symptoms can be detected by the general drooping of the growth, extra dark green color of the foliage and somewhat twisted, narrower and longer-pointed leaves having a coarse texture.

After young trees attain bearing age the milder symptoms differ in grapefruit and oranges. In orange trees the first conspicuous effects of dieback are usually evident as brown spots on the fruit, appearing in July. Preceding the appearance of these spots such fruits are very hard and practically incompressible with the hand. These spots soon develop tiny cracks from which small quantities of gum exude. Evidently the growth pressure of the pulp, combined with the water or sap pressure exerted

against a hardened, non-growing rind splits the fruit, as shown in Figure 4. This phase of dieback is commonly called ammoniation on account of the assumption that it is due to excess ammonia in the soil or in the fertilizer applied. In young bearing grapefruit trees slightly affected by dieback the foliage characters named above are usually in evidence and the amount of fruit set is slight or remains small in size and is very

acreage, irrespective of the drainage or spots where dieback most commonly occurs. To a critical observer who has opportunity to make observations in widely separated localities, there are occasions where no evident reason can be found for the cause of the trouble.

The most prevalent notion regarding the cause of dieback is that it is due to organic ammonia, such as stable manure, chicken manure and organic ammonia used in the manufacture of commercial fertilizers; to an excess moisture in the soil as mentioned above regarding plantings about lakes, streams or swamps.

While in government service I made some tests in a seedling grove that gave some sidelights on the ammoniation phase of this trouble. When the tests were started the grove had been underfed and largely neglected. Groups of trees were staked off for the tests that were continued for three years. On four of these blocks varying amounts of stable manure were used, on one block nitrate of soda and on another sulphate of ammonia, and finally on another dried blood; in all cases these applications were made twice per year and nothing else was given. The trees in the blocks where only moderate amounts of stable manure were used produced medium crops of fruit of good texture and no traces of ammoniation showed up by the end of the third year. Where very



Grapefruit Tree with Dieback,
Before Treating with Bluestone
poor in juice. In late July the fruit on such trees becomes very hard and difficult to compress with the hand. Sometimes it may also split. Cluster buds are usually very noticeable on grapefruit trees.

Causes and Distribution of Dieback

Unfortunately, the causes of this disease are largely unknown, though some of the conditions apparently leading to the development of the trouble often seem evident. If a young grove is set out in a tract of land in which there is a lake, stream, or swamp with shallow banks, or with sand-soak spots scattered about, the trouble practically always makes its appearance on the trees on low ground about the water or in the sand-soaks. In many cases young trees about a barn lot soon develop the trouble irrespective of the drainage. However, it often happens that entire groves of a few to several hundred acres develop dieback practically uniformly over the entire



Grapefruit Tree with Dieback, as it Appeared Next Winter after a Spring Application of Bluestone

THE CITRUS INDUSTRY

large amounts of stable manure were used a small amount of fruit developed ammoniation in late July of the second year and about twice as much the third year. The fruit on these trees was rather thick-skinned and coarse. Where as much as 70



Dieback shoots from grapefruit tree showing clusters of buds on each node.

to 100 pounds of dried blood was used per year the trees had an excessively dark green color, but less than a fourth of the crop developed ammoniation on the second and third years. In the block getting nitrate of soda and in that fertilized with sulphate of ammonia alone, over three-fourths of the fruit developed ammoniation the first year, and repeated the performance throughout the test. The crops on these trees were extra heavy. The fruit on the nitrate of soda block was large, juicy and of good flavor when ripe; that on the sulphate of ammonia block was about half normal size and very insipid. Over half the fruit on these blocks split or dropped before picking time.

As grove-trouble man and advisor during the past five years I have had frequent occasion to investigate and report on unprofitable groves that proved to be affected by dieback. In some of these cases located on Polk county sand hills the soil had apparently become so defective that it was impossible to grow a cover-crop of any kind. An application of fresh stable manure along with commercial fertilizer gave fairly prompt relief. In other cases the cover-crop was still fairly good, but trees were severely affected by all phases of dieback, irrespective of the location relative to drainage. The record of

fertilizer treatment in some of these cases was both interesting and instructive. In the latter type of cases nitrate of soda and sulphate of ammonia had usually been used either largely or exclusively as the sources of ammonia in the fertilizer applied. The idea being to use inorganic ammonia to avoid or prevent dieback. This discussion on the distribution and causes of dieback necessarily leaves one in doubt as to the cause of the trouble, although it gives some hints of value. It practically negatives the notion that dieback is mainly or always due to the presence of excessive amounts of organic ammonia and shows that inorganic ammonia often causes the appearance of the disease, at least in certain cases.

Is Dieback in Trees or in the Soil?

This is a question that in reality is unsettled as yet; some observations indicating that it is a soil condition causing the trouble, and others that the trouble is in the tree. It will doubtless take a carefully planned series of experiments to determine the facts. In many cases where young dieback trees are replaced by new ones the disease does not develop in the resets. In other instances, if young dieback trees are transplanted to other soil, they soon recover and grow normally. In some cases such transplants either die or continue in the diseased condition. A few instances have come under my observation in which what appeared to be normal seedlings were budded and the first growth from the buds was of the dieback type. This might

pointing to the possibility that dieback may be in the tree rather than in the soil in that this disease may be cured by the introduction of a small bit of bluestone under the bark of an affected tree. We know, however, from very wide and general experience, that dieback is easily cured by the application of considerable quantities of bluestone to the soil. This, along with the fact that dieback trees removed to normal soil most often become normal, is usually taken to indicate that dieback is a disease of trees due to certain soil conditions, either as regards moisture or food supply or both. In view of these uncertainties, however, it would appear wise if our state nursery inspection department made some definite budding and transplanting tests to establish the facts, because if dieback and its relative, frenching, are transplanted in buds it would certainly be a help to those setting out new trees to have some protection from these troubles.

Cure for Dieback

Even though we do not know the causes of dieback as fully as we would like, we have learned some methods of cure that answer all practical purposes. The disease is easily cured by the use of bluestone. There are three methods of applying the bluestone: as a spray in Bordeaux mixture, by the insertion of a piece under the bark of the trunk, and by the use of one to six or more pounds applied like fertilizer. The spray method is probably most satisfactory, even though it costs most in materials used. The method of inserting small bits under the bark often gives very satisfactory results, but in most cases more or less damage is done treated trees by the killing of strips and patches of bark that may seriously cripple trees. The usual practice by this method is to insert a piece of bluestone as large as a pea. It doubtless makes a difference whether this is done in spring, mid-summer or fall, in regard to the amount of damage done trees.

During 1914 and 1915 I made numerous tests with varying amounts per tree by application to the soil, always leaving a number of typically affected trees as untreated checks from which to gauge results. Figure 1 shows one of these trees left untreated in 1914, and Figure 2 shows one that was treated in 1914 as it appeared in January, 1915. The tree of Figure 2 was treated in March and again in May, 1914. It bore about half a crop of fruit in 1915.

(Continued on Page 16)



Ammoniated Orange, Showing Manner of Splitting as well as Numerous Discolored Spots on Other Portions of Rind.

be taken to indicate that the budwood had been taken from trees affected by dieback. Another item

Expert Talks on Crop Outlook.

"Generous crops have made the subject of national distribution of paramount importance to the growers," said Mr. Skelly, general sales manager of the Florida Fine Fruit Company, when talking over the citrus prospects for the coming season. Mr. Skelly has just returned from a trip of six weeks through the north, and has been in close touch with the trade and their representatives.

"Labor conditions throughout many sections of the country are unsettled at the present time," Mr. Skelly continued, "although the probabilities are that conditions in many lines will improve somewhat during the fall and winter months. Wholesale dealers in many lines have suffered severe losses during the past few months, therefore, they are not buying futures in citrus fruit as they have in past seasons. This not only applies to citrus fruits, but apples, potatoes, cabbage, etc., which have heretofore been bought in large quantities for storage purposes. Of course, another thing which would control the buying of futures to a large extent is that money is scarce and it is hard for the dealers to obtain financial assistance from the banks.

"I had the pleasure during my trip of calling on many of our representatives and on the trade in the principal markets of the country. They all have confidence in being able to secure fair prices for good fruit well packed and graded and laid down in sound condition. Of course, if a quantity of green fruit is thrown into the markets of the country at the beginning of the season, no doubt after every market gets crowded with this fruit, they will not take any more of it for from four to six weeks. This matter is largely in the grower's hands as well as the shipper's, and every grower in the state should see that his fruit is not picked by any marketing organization or purchaser until it is in such shape that he can eat and relish it himself. Certainly, it would not seem plausible for the growers to expect good prices for fruit that is not fit for human consumption.

"In years of short crops and great prosperity, it is not difficult to market fruit at satisfactory prices, but at times of large crops and unsettled conditions, as at the present time, it will require the most careful distribution and selling to secure

for the grower a satisfactory profit on his labor and investment. The grower who has expended his time and money in producing fruit that is superior in quality naturally is desirous of securing the premium that such fruit should bring.

"Our field representatives have made a careful survey of the state, and the consensus of opinion is, that while the orange crop is slightly larger than last season, the grapefruit crop is somewhat smaller. On the whole the probabilities are that not a box more of fruit will be shipped out of the state this season than there was last season. The crop of oranges at the present time, on the whole, is of excellent quality and size, and with favorable conditions from this time forward we should have a very desirable crop of fruit in the state this season. Grapefruit that has been properly cared for this year is in very fine condition while some small crops which have not had proper attention are showing up very poor quality of fruit.

"Our growers the past season were highly pleased with results obtained for them and our tonnage will be materially increased for the coming season. We have added many new packing houses in the most important fruit producing sections of the state.

"Having a very strong selling organization and wholesale stores connection in all of the principal markets of the country, our shippers can feel assured that they will receive the highest market prices obtainable for their products.

"No doubt the growers in this state will be interested in the latest figures available on all crops. For their information we beg to submit the following figures:

"The apple crop is over 32,500,000 barrels, an increase of nearly 6,000,000 barrels over last year. The increase in the apple crop this season is in the eastern states. The Irish potato crop in most states will be heavy, the last estimates being 402,000,000 bushels, an increase of 40,000,000 bushels over last year. Sweet potatoes will show over 100,000,000 bushels, but will be slightly under last year. Cabbage is estimated at 48,000 cars, or 17,000 cars more than last year. The northern celery crop is large and fully equal to last year from the present indications.

California has left at the present time 1,000 or more cars of Valencias

and shipments of this fruit will probably continue up to November 5-10. The northern navel crop is considered to be very good this season and will begin to move about November 15. The southern navel crop generally starts going forward around the first of December. Of course shipments will not be so very heavy on this fruit until the first of the year. The southern navel crop is estimated at 50 per cent over last season.

"We are promised more and better railroad equipment for the handling of our perishables this season and we have every reason to believe that this end of the business will be better taken care of than during the past several seasons.

"While the distribution of fruit this year will require more skill than during the past few years, people of the United States are eating much greater quantities of fruit and vegetables per capita, and we have no reason to look with pessimism on the situation."

SPRAY FOR ORANGE TORTRICID

The orange tortricid or "tortrix," as it is sometimes called, is a small light-green caterpillar living in webs or burrows. It sometimes webs leaves together, or burrows through the rind of oranges or grapefruit, but not into the pulp. It seldom appears in injurious numbers, says J. R. Watson, station entomologist, but is causing frequent complaint this year, as high as one-third of a crop being reported lost on account of it this year.

The burrows are commonly started where two fruits come in contact or where a leaf touches a fruit. The leaf will be found fastened to a fruit by means of a few fine silken threads, and the caterpillars will be more numerous on grapefruit than on oranges.

Spray with lead arsenate, $1\frac{1}{2}$ pounds of powder or 3 pounds of paste in 50 gallons of spray. This may be added either to the spray used for purple scale or whitefly, or to the sulphur sprays used against rust mites. In the latter case, care must be used, as the lead combines with the sulphur, and the resulting material has been known to burn tender foliage.

Further information concerning this pest may be obtained from Florida Experiment Station Bulletin 148, which is sent free.

Citrus Limonium--A Tragedy.

By Arthur M. Duke

From Sicily we, of the good old U. S. A., have been accustomed to receive a number of things, swarthy immigrants, the gentlemen wearing rings in their ears and often affecting a fondness for carving which sometimes led them to use their talents upon convenient portions of human anatomy when other materials were not so convenient, grind-organs, pumice and lots of things, and—lemons.

This particular tragedy, instead of dealing with the Mafia and other common or garden variety of Sicilian tragedy producers, has to do with the citrus limonium of Sicily, and the tragedy which recently has come as the result of the advent of the fruit of said citrus limonium in overabundant quantities in certain of our markets.

Most acts of slaughter are tragic, and the slaughter of lemon prices in United States markets as a result of the importation of Sicilian lemons in quantities has been "sumpin' fierce," to quote the lady stenographer of a New York representative for certain California lemon producers.

Following John Barleycorn's demise, California lemon raisers obtained a lot of valuable, if rather costly, information upon the subject of how largely lemons previously were consumed by the saloon trade in eastern cities. Yet there was the feeling in many quarters that the situation would brighten as the family demand for lemons in drinks and cookery, and the soda-fountain trade's requirements reflected the transfer of lemon consumption to other channels. Thanks to special efforts on the part of California producers, there undoubtedly has been considerable stimulation of lemon consumption; but the advent of the aforementioned Sicilian offerings has played hob with the hopes of the Californians as to possibly profitable prices for their own offerings of lemons in the markets.

Going back to the source of things, following the practice of the best analysts, it all really is the fault of Biff "Hohenzollern" the one-time crown prince and the rest of their crowd. This because the well-known war brought on the present remarkable situation in foreign exchange, and the present high price of American dollars in foreign countries has

quite a lot to do with the pressing difficulties of the lemon raisers of California.

I had a man figure it out for me that a Sicilian exporter selling his lemons in New York for two dollars and fifty cents per box, good old U. S. A. money, actually was receiving the equivalent of the sale of his goods at seven dollars and fifty cents per box, in money which is usable to him in Italy. I am not able to contradict this statement. On the contrary, I feel the gentleman was reasonably accurate in his computations. Therefore, it is entirely easy to see why these gentlemen of the island of Sicily should be so busily engaged in starting their shipments toward American ports. In fact, it becomes fairly easy to imagine the gentlemen in question anticipating the arrival of their shipments with gratification, if not to say glee; and licking their chops while contemplating the figures of their account sales, provided the licking of chops is a trait of Sicilian character.

On the contrary, these same results so popular with the Sicilian gentry have spelled disaster to the lemon sections of the Golden State. The cost of lemon production hasn't gone down a bit. Rather it has continued upward in common with the cost of production of every other thing in this country of ours. Therefore, when some producers, whose offerings arrived in the markets close following large cargoes of Sicilian lemons, witnessed the spectacle of their products selling for ninety cents a box, it was with all the anguish attendant upon a very real and grim tragedy.

Early in the season one very prominent California speculator brought upon his head great gobs of grief, if not to say vials of wrath, when he declared his unwillingness to buy lemons of any sort except upon his own terms of one cent per pound. The later turn of events, however, has shown the accuracy with which this man forecasted the trouble which was to come. The Lemon Products company of California is helping the situation to quite an extent, in that it is paying some of the growers something for some of their lemons, something, even if very little, being considerably better than red ink. Of course, how-

ever, it is not going to be possible to turn all of California's lemons into by-products, and thereby hangs the tale of greater grief.

Meantime, what are the California producers to do? Grin and bear it? Even if some of those best fixed financially may be able to bear it, for a time at any rate, they hardly may be expected to do any grinning, or anything else which might be taken to indicate a manifestation of pleasure in the present circumstances. It costs good money, and plenty of it, to maintain a lemon property in these days of the high cost of everything except Sicilian lemons. Obviously the all-going-out-nothing-coming-in condition is one which cannot long be endured by many engaged in the business. Indignation is good for some things, but it is not good collateral with the banks or supply manufacturers. Resignation may be a more comfortable state of mind, but from the standpoint of collateral it is equally useless.

Representations have been made to Washington, and to every other place where representations well might be made; but not even the most optimistic representers are willing to state any real good has been accomplished. Suggestions and advice have been received, but the nub of it all, when analyzed, is to the effect that California lemon producers may after all be able to make a living by taking in each other's washing if all other sources of livelihood fail.

Whether or not any blame lies upon Washington, I honestly do not know. Of one thing, however, I am certain: A California lemon grower can say the words, "democratic administration," in a way which gives them about the most unpleasant, if not to say nasty, sound which the human ear finds it possible to comprehend in connection with words ordinarily innocuous if not commonplace. In fact, "democratic administration," as spoken today by a Californian whose source of gasoline for his twelve-cylinder car previously has lain in receipts from lemon sales, takes on a new and entirely individual meaning.

We long ago had it drilled into us that the darkest house is just before the dawn; and the Californians engaged in the playful pastime of pro-

(Continued on Page 17)

Eleventh Annual Citrus Seminar

October 5th and 6th

The eleventh annual Citrus Seminar will be held at the University of Florida, October 5th and 6th, conducted by the agricultural extension division of the College of Agriculture.

The program will consist of lectures, papers, discussions and demonstrations of special interest to citrus growers. The principal speaker will be Dr. H. J. Webber, who began studying orange diseases in Florida in 1891. Since then Dr. Webber has engaged in plant breeding investigations, carried on by the United States department of agriculture; was for a time professor of experimental plant biology, Cornell university; and for a time acting director and professor of plant breeding, New York State College of Agriculture.

Since 1912 he has been engaged in horticultural research work in California as director of the citrus experiment station, professor of plant breeding and tropical agriculture, dean of the graduate school of tropical agriculture and director of the California experiment station at Berkeley.

To the older growers of the state, Dr. Webber needs no introduction. He stands as a national authority on citrus, and the extension division of

the university is gratified over the fact that he will take an active part in the coming Citrus Seminar.

The remainder of the program is being prepared and will be published at an early date.

Program

Tuesday, Oct. 5.—Invocation, Rev. I. C. Jenkins; opening addresses; response to opening addresses, Hon. W. J. Sears, M. C.; "Fewer Fertilizer Formulas," Dr. J. N. Harper, soil improvement committee, Atlanta, Ga.; "Fertilizer Guarantees and What They Mean," Dr. R. W. Ruprecht, physiological chemist Florida Experiment Station; "Economic Use of Fertilizers in Grove Culture," E. F. DeBusk; "Potash and Phosphoric Acid in Citrus Fertilizers," B. F. Floyd; "Present Prospects in Nursery Stocks," F. M. O'Byrne; "Control of Rust Mites in Groves," W. W. Yothers, bureau of entomology, U. S. A.; "Quarantine Inspection Work," Dr. J. H. Montgomery; "Citrus Canker Situation," Dr. Wilmon Neill, State Plant Board; "Marketing Produce," L. M. Rhodes, commissioner State Marketing Bureau; "Farm Bureau Organization," W. C. Lassetter, editor southeastern edition Progressive Farmer; "Tractors for Grove Cultivation," Prof. Frazier Rogers; "Problems of Citrus Cul-

ture," Dr. H. J. Webber, formerly director California Experiment station.

Wednesday, Oct. 6.—"Citrus Nursery Stocks," Dr. H. J. Webber; "Branch Citrus Experiment Station," Dean P. H. Rolfs; "Discussion of Fungus Parasites of White Fly," Dr. E. W. Berger; "Cover Crops in Citrus Groves," J. B. Thompson; "Work and Status of the Florida Experiment Station," Dean P. H. Rolfs; "Drainage for Citrus Lands," A. O. Kay, Bureau of Public Roads, U. S. D. A.; "Results of Fertilizer Experiments With Phosphate and Potash," Dr. R. W. Ruprecht; "Parasites that Destroy Citrus Insects," J. R. Watson; "Storage of Citrus Fruits," Dr. L. A. Hawkins, Bureau of Plant Industry; "The Freight Transportation Situation," C. E. Hix, superintendent transportation, S. A. L. Ry.; "Citrus Fruits in the Hands of the Housewife," Miss S. W. Partridge, State Home Demonstration Agent; "Thrips on Citrus Trees," Prof. J. R. Watson; "Review of Some Grove Practices," B. F. Floyd; "Some of the Needs of Our Educational Institutions," C. E. Stewart, Florida Citrus Exchange.

There will be a general display of spraying machinery and equipment by manufacturers and dealers, displayed for the growers.

THE ORIGINAL DUNCAN

GRAPEFRUIT TREES

Several weeks ago Secretary Hemphill of the board of trade published an inquiry in the Clearwater Sun relative to the original Duncan grapefruit trees. George P. Wooddell of the Dellwood Nurseries replies to the inquiry as follows:

"In replying to your inquiry in the Sun of August 13th, would say that the original Duncan grapefruit trees are to be found in an old grove 'n Safety Harbor, known as the Dr. J. G. Snedecor grove.

"The Country Gentleman seems to have gotten its 'citrus stuff' somewhat mixed or the 'Tale of Two Trees' twisted together. The large tree referred to is to be found in the grove of Mr. John R. Davey, one mile west of the Duncan tree, and Mr. Davey can tell you about the crop referred to.

"If you wish to get more of the history of the 'Duncan grapefruit' it is like this: About 1885 or 1886, the Milwaukee Grove Company of

Dunedin started a citrus nursery (now keep in mind grapefruit in those days were not considered of value).

"Mr. A. L. Duncan was then the general manager for the Milwaukee company and a friend of Dr. Snedecor (all being members of the same Presbyterian church at Dunedin). One day late in summer Mr. Duncan and family were calling at the Snedecor home and the fruit was so very fine it appealed to Mr. Duncan, who took some of the buds for his nursery and said he would name it the 'Snedecor' grapefruit, but Dr. Snedecor, being a very modest man, said: 'No, call it the Duncan,' and Duncan it has been ever since.

"Dr. William Brown (a retired Presbyterian minister) lived at that time at Bayview, and was also a close friend of Dr. Snedecor and Mr. Duncan. Dr. Brown had an extra early orange that Mr. Duncan took buds from and called it the 'Parson Brown' in honor of Dr. Brown. Now there is a 'Parson Brown' orange

still catalogued, but I will not claim it to be the 'Parson Brown' of Bayview origin, for I do not think Bayview or Pinellas county ever had as poor an orange as the one sold as Parson Brown now. I think, perhaps, the Dr. Brown orange was lost entirely in the freeze of 1894-95.

"If you wish to go further into this, you may be able to get a copy of the Milwaukee Nurseries from some of the 'old timers' of Dunedin."

AN UNUSUAL YIELD OF FINE GRAPEFRUIT

While it is variously estimated that the grapefruit crop of Florida this year will be but about 60 per cent of last year's crop, there is at least one grove in the state which reports an enormously increased yield. This is the big Atwood grove, known as "Manavista," on which it is reported the heaviest crop of grapefruit ever produced is now about ready for picking.

Orlando Starts Something

Orlando, one of South Florida's most beautiful and at the same time most progressive and hustling business towns, has had the courage to actually start something in connection with the great annual gathering of Florida growers, the Citrus Seminar.

Recently numbers of citrus men through Florida received a modest little printed notice, reading thusly:

"Resolutions Passed by the Orlando Board of Trade

"August 9, 1920

"Whereas, It has been called to the attention of the Orlando Board of Trade, by the citrus growers, many of whom are members of this organization, that the Citrus Seminar, which has been held regularly at Gainesville, Fla., is not only poorly attended by the citrus growers of the state, but that its effect along educational lines has been nullified by the fact that it is held in a non-citrus growing section.

"Whereas, We believe that by holding this seminar in the citrus sections of the state, where practical demonstrations can be given and satisfactory instructions from field practice taught. Therefore be it

"Resolved, That the Orlando Board of Trade requests the Florida Agricultural College, its faculty, and those who have to do with designating the place that the seminar shall be held, that the Citrus Seminar be held this and succeeding years at some logical point in the citrus section of Florida. Therefore be it

"Resolved, That it is the sense of the membership of this organization that the Citrus Seminar fails to fulfill its purpose unless these meetings are located in a citrus-growing section."

Perhaps it was unfortunate that this did not come through the mails until after the announcement of the usual holding of the annual Citrus Seminar at Gainesville, with a hint as to the tentative program. However, it has served as a forceful reminder of last year's seminar, and the general dissatisfaction which resulted from it.

Not to express an opinion of any nature upon the subject, it is a simple statement of fact to say that a

very great many of the growers in attendance at last year's gathering expressed much disappointment. Statements were made to the effect that the gathering had in no way been a representative one, a great many growers from sections considerably removed from Gainesville failing to attend, and occasioning an absence of much of the interchange of opinion and experience between growers outside the program hours, which many stated they had come to regard as the most valuable feature of such a gathering of citrus men.

Dissatisfaction also was expressed by many with the program as given. By some statements were made to the effect that the percentage of practical growers upon the program was too small, and the proportion of theoretical experts too large. Again, complaint was voiced that more than one expert largely gave of the time allotted to him to explain the character and the value of the work in which he was engaged, and his own unflagging and painstaking devotion to it, rather than to things which some growers felt could well have been substituted with greater interest to the practical men present. Also the suggestion was made by some that the atmosphere of Gainesville, with its business of education and entire absence of growing citrus groves, was not the best in which to work out the most practical and interesting program even should it be prepared.

These and other criticisms, and expressions of disappointment were freely expressed. Some found their way into the columns of newspapers whose custom has been to pay close attention to citrus affairs. In one or two instances editorials appeared making the precise suggestion which the Orlando men have had courage to put into print.

It is hardly to be expected that the place of holding the Citrus Seminar may be changed, unless a sufficient number of Florida citrus growers very decidedly express desire for the change. In fact, the logical place of holding it to the casual person seems to be where it is now held at Gainesville in connection with the State Agricultural College. Therefore, if it ever is to be held elsewhere it is apparent considerable pressure must be exerted upon the various authorities to bring about the change.

It is only fair to Dean Rolfs and

others concerned in the conduct of the seminar to say the various expressions of dissatisfaction with last year's gathering were in no way to be construed as personal criticisms of them. Seemingly, they simply were genuine expressions of disappointment at the non-representative nature of the gathering; and regret that speakers in making many references were not able to point out the actual thing about which they were talking, as might easily have been possible in many instances had the gathering been held where citrus groves abound on all sides.

Also, numbers of growers who made the long journey to Gainesville had been forcefully reminded of the distance by the generally miserable railroad transportation, or by the miserable condition of the automobile roads in some places necessary to traverse to reach Gainesville. They thus had come to ponder as to whether or not it really was better to hold the seminar at Gainesville to enable the easy attendance of a dozen or so agricultural students, or to hold it at some place within easier access to enable the attendance of hundreds of growers, and allow the students the advantages of a little travel.

Orlando, through its progressive board of trade men, has reopened the subject. Following receipt of Orlando's reminder some growers have stated they are hopeful the subject will not be dismissed until the annual gathering is held somewhere in the vicinity of a good grove area, and preferably in some centrally located point of greatest convenience to the greatest number of growers, who are the ones expected to profit most by the conduct of the Citrus Seminar.

FLORIDA SHIPPED 12,495,925 BOXES OF CITRUS FRUIT

By rail and water Florida growers shipped 12,495,925 boxes of citrus fruits last season, according to statistics compiled by Robert Taylor, fruit and vegetable agent of the A. C. L. railroad. These shipments included grapefruit, oranges, tangerines and limes. The A. C. L. hauled 7,618,201 boxes; the Seaboard Air Line hauled 2,492,720; the Florida East Coast 1,380,691, and the Charlotte Harbor & Northern 449,133; while the various steamship lines carried 55,190 boxes.

One Reader's Experience With Dynamite

Blasting stumps is not the cheapest way to get stumps out, when you consider first cost alone. But it is cheaper than not getting them out at all and having to hire inefficient labor. Also, my method is contrary to what the powder companies are preaching, but I have tried both for two years and know what I am talking about. They say to start at the surface of the soil and bore straight down, or at an angle so as to bore down the center of the taproot for two, three or four feet, according to the size of the stump. Try it and see how far you will miss the center of the stump, and then try to teach some negro to do it. You'll find it slow work and hard work. You won't save any powder or, if you do, it will be as nothing compared to the greater amount of work you have done.

My way is to choose a time, if possible, when the soil is wet. If the land is low, don't wait until it gets under water, as the holes will run full of water and bother you about placing your charges under the stumps. But choose a moist or near wet time and have plenty of powder, caps and fuse. Also, cap crimpers and a sharp knife to cut fuse with. Take a shovel or scoop—anything will do, but a narrow shovel is best and handiest—and dig a small hole down beside the stump to expose the taproot. Dig the hole as narrow as possible and dig it on the side of the stump that offers the least resistance. Dig the hole about 14 or 18 inches deep down beside the taproot. If it is a big stump and has a small taproot, bore the hole or punch it three or four inches beyond the taproot. Then see that the hole is open so that your powder can be tamped down to its place and proceed to load or place the charge. Cut the sticks of powder in two and slit each one three or four times. Then put in a half stick and tamp it down to where you want it and then tamp the rest of your charge down on this one. See that every piece is tamped down good and hard before putting in another piece. The secret of success is in putting your charge in the right place and in tamping.

Load the stump so that your charge will be as near the center of resistance as possible. Digging the hole on one side of the stump weakens that side of the stump a little, so you want to take that into consideration and place the charge a little farther to the off side of the stump.

Also start the charge far enough back so that you can put in whatever amount of powder you think it will take to blow up the stump and have room enough left in the hole to tamp in at least four or five inches of moist dirt or clay. The clay is better, as it offers more resistance and holds the charge better. Then fill up the hole you dug beside the stump and pack it well and you are ready to bid that stump good-bye forever.

I have just finished stumping 15 acres and did it with one negro in three days. Could have done better, but broke my auger and had to take it to town to have it fixed.

The piece of land I stumped was low, wet, sandy land and the stumps were great big fellows with a taproot almost equal to the stump. The lateral roots were worse than the stumps. The stumps would have averaged 18 or 20 inches across three feet from the ground and cost me about 35 cents a stump, including hired help.

Trees can be blasted about as well as stumps. Put in enough powder to blow up the stump and then put in a stick or so extra to lift the tree. However, in blasting trees try to get all your powder in the stump or taproot of the tree, so as to help cut the taproot off.

If you should wish to blast green stumps or trees, you can figure on putting under two or three times as much powder as it would take to blow up a dead stump of the same measurement and under the same circumstances. If there are only a few green trees I dig around them and maybe put in a small charge in the taproot so as to blow out on one side and burst it up a little and then pile stumps around it and burn it out. You can burn one out this way in 10 or 12 hours.

When you start to blow up stumps don't tackle the largest one first. Blast a few small ones until you get onto it and then try some of the larger ones. Put in enough to be sure to do a clean job of it, or you will soon get discouraged and quit. Use plenty on the first one and if it blows the pieces too far, cut down upon your next one a little and keep doing this until you can tell just what will be required.

Here is another good hint if you want to speed up the job. Cut your fuse lengths at night, fit your caps on them and you may also load the fuse and caps into half sticks of powder and keep the loaded sticks of powder in a separate box from your other powder. You can then do all the digging and all the blowing of the stumps yourself and let two negroes keep steady boring. If you have good hands boring you ought to blast from 150 to 300 stumps a day.

When stumps are thick or in thick patches, if the land is not too wet, load up several stumps before firing any of them and you can make better time, as you can come off out of reach of the flying stumps and roots and be fixing another batch ready for firing.

I think the cap and fuse method is best for the common farmer, as it is cheaper than the electric caps and will serve the purpose just as well.

I had far rather clear the land of blasted stumps than of pulled stumps. Most of the blasted stumps will be split up into pieces small enough to handle without much trimming or splitting, and one can ship them for distilling purposes or haul them to the house and use them for wood.

GEORGE TERRYBERRY ASKS A QUESTION

Mr. George Terryberry of Winder-
mere, Fla., now living at the DeSoto
Hotel, Tampa, has just returned from
the oil fields, having been to the
Texas and Louisiana fields four times
this year. Terryberry states that the
oil boom is over. The fake companies
have been found and he advises that
purchasers of oil stocks use the same
judgment and discretion in selecting
an oil stock that they use in selecting
a bank. "When you select a bank
you do so for safety; then why not
use the same judgment in selecting
an oil stock?" asks Mr. Terryberry.
Oil is the financial giant of the
world today.

Fine New Packing House for Lakeland

At the annual meeting of the
Lakeland Citrus Growers Association
plans for the erection of the new
packing house were informally dis-
cussed. It was determined to push
the project to completion in order
that it may be in readiness for the
handling of next season's crop. One
of the finest plants in the country is
to be installed in the new structure,
the machinery and equipment to be
the last word in modern devices for
handling and packing fruit with the
greatest speed and cleanliness.

Exchange President Back from the North.

Returning from a 10,000 mile trip through the north, devoted to effort for increased efficiency in the sales department of the Florida Citrus Exchange, Dr. J. H. Ross, the president of that organization, is now at his home in Winter Haven.

On portions of his journey Dr. Ross was accompanied by C. E. Stewart, Jr., business manager, and George A. Scott, general sales manager of the exchange.

Hale and hearty, despite his advanced years, Dr. Ross appears to have gained vigor on the trip, notwithstanding inconveniences of travel to which he was subjected. He spoke with considerable enthusiasm as to the loyalty and energy of the representatives of the Florida Citrus Exchange in the leading northern markets and explained that arrangements have been completed for a material extension in the territory covered by the sales department of the organization. Dr. Ross also expressed himself as greatly pleased with the evidences found by him of the success of the endeavors of the exchange to build up demand among housewives for Sealdsweet grapefruit and oranges.

CITRUS CROP OVER-ESTIMATED SAYS MANAGER GUMPRECHT

The estimate of 16,000,000 boxes as given in the Monthly Business Review, issued by the Federal Reserve bank of Atlanta, is either a misprint or entirely over-estimated.

Manager H. G. Gumprecht of the Manatee County Sub-Exchange only recently returned from an extensive trip throughout the citrus belt and claims to know. He fully confirms the statement made by Mr. C. E. Stewart, general manager of the Florida Citrus Exchange, who wired from New York to the Tampa Tribune, stating that the above estimate is entirely too high, and Mr. Gumprecht states there is no one in a better position to estimate the citrus crop of Florida than Mr. Stewart.

However, Mr. Gumprecht states that it is his personal opinion that the orange crop is normal and the grapefruit crop at least 25 per cent short at this time, which will make the total crop considerably less than the past season, and he further states that overestimating any crop is detrimental to the grower's interest and should be avoided.

Florida Fruit

"In many markets where previously California oranges had the best of things, I ascertained that now Florida fruit is more in demand," Dr. Ross said. "The leading wholesale dealers are free to admit that almost entirely this changed condition is due to the advertising and demonstrations by the Florida Citrus Exchange of the greater juice content and general superiority of Sealdsweet oranges. At the same time, our educational campaign on grapefruit has been 'digging in' with the housewives of the country and their response to its appeal was indicated by the enormous quantities consumed last season. The grapefruit habit has been formed by one or more members of hundreds of thousands of families in the past two or three years and every convert to these healthful fruits means a missionary in their behalf," he continued.

Production Costs

"The members of the Florida Citrus Exchange generally are agreed that the profits of the citrus industry in the future will depend almost if not altogether as much upon the

degree to which production costs can be kept down as they do on the prices received for the fruit. So the exchange has been building up a system by which the affiliated growers become buyers at wholesale as well as sellers. In other words, it has been made possible, through the Exchange Supply Company, for members to purchase their grove and packing house supplies co-operatively and at quantity figures, saving them hundreds of thousands of dollars annually. Already the economies effected by the Exchange Supply Company more than offset the cost of marketing fruit by the Florida Citrus Exchange. It will not be long until the supply company's savings to growers will even more largely contribute to the profits of members of the exchange who take advantage of its operations. In these respects, the organized citrus growers of Florida are well in advance of the business interests of the rest of the country, the thought of which is centered on ways and means of securing greater production at lower costs," Dr. Ross concluded. — Jacksonville Times-Union.

INGERSOLL BUYS

LAKE COUNTY LANDS

Charles H. Ingersoll, of dollar watch fame, is head of a company which has acquired 15,000 acres of rolling land in Lake county, surrounding Sorrento and coming within a half mile of Mt. Dora and two miles of Eustis. One thousand acres will be cleared as the first unit of a development of what is expected will be one of the most notable projects in the state. Groves, orchards and truck farms will be laid off and developed, together with a system of roads. Pensioned employees of the Ingersoll company will first be given opportunity to acquire ideal homes in Florida, and the general public will be able to purchase holdings as the propositions proceed.

W. C. Daniels, for years a traveling representative of the Ingersoll company, and himself owner of 800 acres in Lake county, interested Mr. Ingersoll in Florida and after careful survey the deal was consummated. Engineers say there are less than 200 acres in the tract that are not arable. Ingersoll was prominent in the third party convention at Chi-

cago and his connection with the big watch-making firm has put him in touch with other investors who have become interested in this state and who are now looking about with a view of acquiring similar tracts.

It is the intention of Mr. Ingersoll to sell no part of this tract except in complete, improved farms or groves, and until preliminary work has been completed nothing will be done toward putting it on the market. As the Ingersoll company has 20,000 employees a large part of the developed tract will probably be taken up by them as soon as conditions warrant.

Recent Citrus Sales Near Lake Wales

Among the recent sales near Lake Wales was that of the Kincaid and Ensinger grove for \$30,000. Another sale of importance in this locality was that of the Schaty grove to a Mr. Davis of New Hampshire for a consideration of \$10,000. These are only a few of the many grove deals which have been made in this locality during the early summer months.

DIEBACK OF CITRUS TREES

(Continued from Page 9)

The one shown in Figure 1 was treated in March and May, 1915, in the fall of the year it looked very similar to Figure 2. The old expression, "before and after treatment," is very expressive when used with these two figures.

Since 1915 literally hundreds of acres of grove trees have been treated for dieback by this soil-treatment method and with very marked success. In most cases only one application was made, but I have noticed that with trees as severely affected as that shown in Figure 1, most prompt and satisfactory results follow when two applications of bluestone are given only a few months apart: preferably in spring and mid-summer. Trees of the size shown in the cuts got two to five pounds per application in the tests, but in practice two to three pounds have been found enough to effect a cure, if given two times.

This soil treatment is not very expensive in view of the fact that one may reduce the amount of fertilizer during and immediately following the treatment by about a fourth and still get splendid and satisfactory response. In fact, dieback trees will make more growth from the bluestone treatment alone than can be secured with any amount of fertilizer without the bluestone.

As stated above the ammoniation phase of dieback is also cured by the use of bluestone on the soil. However, an application made in summer or fall does not affect the crop then on the trees, though it will prevent the appearance of ammoniation on the next crop if the application is made heavy enough. The dose for bearing trees should be about a pound per box capacity, except for very large trees covering about all the ground: they should be given about ten pounds each.

Conclusion

Dieback is a disease that manifests itself by extra dark-green foliage, drooping S-like branches, and often in rather long-pointed coarse leaves, by the shedding of immature leaves, clustering buds and gum blisters on the shoots, more or less gumming of bark, brownish outgrowths on twigs and branches, and the dying back of shoots.

The causes of the disease are only partially known. It can be produced by the use of liberal quantities of inorganic ammonia, as shown by tests, and to a less degree by excessively large amounts of organic am-

THE CITRUS INDUSTRY

monia, such as stable manure. When the disease appears only in spots in a grove, these are usually the wet places about lakes, etc., but under certain conditions and treatments dieback becomes general in groves. It seems, therefore, that fertilizer and cultural treatment of groves is important in its relation to the development of the trouble. It seems possible that a certain balance between the ammonia and the phosphoric acid is necessary, depending upon the nature of the soil and the season of the year, and the amount and kind of cultivation given a grove. I have seen trees severely affected by dieback in low spots recover to quite a degree during seasons or years that prevented the cultivation of such land, allowing it to grow up to weeds and grass.

Bluestone is very effective for the cure of this disease. The most practical method of application is like that of fertilizing. Affected trees are much improved by spraying them with Bordeaux, and I have seen trees cured by the insertion of small bits under the bark of the trunks. However, this method is more dangerous to trees in that many such trees are seriously crippled by the treatment. It may be that a correct dosage effective and yet harmless could be determined by experiment at different seasons of the year. At present the soil treatment is most practical. In severe cases two equal applications of bluestone should be made; preferably in spring and early summer.

FLORIDA TO GUARD AGAINST WEST INDIAN BLACK FLY

(Continued from Page 5)

by the legislature, of which he is a member, for that purpose. However, he said there might be some opposition to an adequate appropriation, but if it were properly represented to the legislature that all the agricultural interests of Florida were interested equally with the citrus interests in protection against the black fly, he believed action could be obtained.

Congressman H. J. Drane of Lakeland said he had as yet been able to obtain but little information on the subject of black fly, but he, as a grower, was perfectly willing to accept the conclusions of the growers of Florida as represented in this meeting and he was with them heart and soul. He said the growers could rely upon his closest co-operation and hardest work at Washington in behalf of whatever steps the meeting

should decide to inaugurate.

Chairman Campbell of the resolutions committee then presented carefully drawn resolutions which, after reciting the situation, requested the secretary of agriculture to set a hearing before the federal horticultural board, at which the growers of Florida might be heard. The resolutions asked for the appointment of a committee of seven by Chairman Floyd, the chairman himself to be one of the members, to present the matter before the federal horticultural board and follow it up before any and all other departments of the government where it might seem advisable. The resolutions were adopted unanimously.

W. J. Krome then called attention to the fact that it might be well for this committee to report promptly to the growers upon the occasion of the Citrus Seminar at Gainesville on October 5-6 next. Mr. Krome also suggested that suitable arrangements should be made by those present to defray the expenses of the committee as Mr. Floyd might appoint it. This met with general approval and a considerable sum was subscribed on the spot by various interests and individuals.

Later Chairman Floyd announced the appointment of a committee to handle the matter, as follows: C. E. Stewart Jr., Tampa; W. J. Krome, Homestead; J. C. Chase, Jacksonville; H. Harold Hume, Jacksonville; S. J. Sligh, Orlando; John S. Taylor, Largo. Four of the members appointed, with Mr. Floyd, were present at the meeting and went into a night session immediately to outline the beginning of their work. A report of the committee will be looked forward to with great interest by the growers who assemble in Gainesville for the Citrus Seminar.

At the conclusion of the meeting Mr. Floyd was heard to be complimented highly by a number of the growers present for the able manner in which he handled the gathering, with entire fairness to all the various interests represented, and confining the various discussions closely to the subject which the meeting was called to discuss.

J. W. Browning has purchased a 25-acre combination farm and orange grove of E. F. Deratt. This property is located four miles west of Plant City on the Tampa and Plant City brick road. There are over 200 orange trees on this place, 100 of which are large old seedling trees.

THE CITRUS INDUSTRY

CITRUS LIMONIUM—A TRAGEDY

(Continued from Page 11)

duing very splendid specimens of the fruits of the citrus limonium today are spending much time in consultation with ouija boards, market prophets and other sources of accurate advance information, in an endeavor to ascertain just when the zero hour may be expected to arrive.

The foreign exchange situation has for months been such as to make it a foregone conclusion that literally every country of the world, excepting Argentina, whose currency is worth even more than ours, may be expected to gather up everything of possible value it may expect us to accept from it, and to bundle it off to our shores posthaste, which has nothing whatever to do with the posts, the post-office or Mr. Burleson, in an effort to pay the tremendous accumulation of bills. It has been an unfortunate combination of circumstances that the fruit men of Sicily have been such ardent and efficient gathers, and—that California producers are entirely unable to eat, drink or otherwise consume their own lemon crops.

If you who read these lines are able to find anything which savors of humor or fun in the way this little article may be constructed in its play upon words to describe the situation, be assured it is absolutely the only funny thing in connection with it. Contrariwise, a continuation of the predicament which has come upon California lemon culture over any long period must be tremendously serious, even tragic.

Thoughtful men will find in this situation food for contemplation. If we of the United States are to continue pushing up our costs of production through high wages and high prices for whatever we buy to enable production, how long will it be before many other things besides Sicilian lemons may be expected to arrive from foreign shores to inject themselves just as forcibly into our domestic economics, and with just as dire results for our own products which must meet them in the markets. Truly, it looks as if in this way we finally must find our readjustment to normal levels, if that readjustment is to come. However, it is most unpleasant if not inconvenient to find yourself being readjusted as in this instance, while other industries of our country still are carrying costs upward, and, apparently, with the peak not yet reached.

CITRUS FOOT ROT

Foot rot is common in the old seedling sweet-orange groves throughout Florida. It is a bark disease and begins in the crown or main roots about the surface of the ground in small areas of decayed bark from which there is a slight oozing of gum. This decayed bark has at first a water-soaked appearance, and a watery gum is usually found beneath it. The diseased portions spread upward, downward and around the tree, sometimes practically girdling it.

The cause of this disease has long been in doubt. It is considered infectious, that is, capable of being spread, and recent investigations by experts at the Florida experiment station indicates that it is a fungus.

Foot rot may be controlled if remedial measures are taken in time. Groves should be occasionally inspected for it. Once or twice during the year the crown and main roots should be examined, and, if the disease is present, treatment should be applied at once. Remove the soil from about the crown and base roots so as to expose all infections. Cut away all diseased bark and destroy it. Some antiseptic should be applied to the wounds. Crude carbolic acid diluted to half strength with soapy water is good for disinfecting. In addition, paint the crown, exposed roots and trunks of affected trees with a wash of air-slaked lime and powdered sulphur and sufficient water to make a mixture that can be supplied easily with a brush. The trunks of the trees may be painted as high as two or three feet above the ground.

It is advisable to leave the crown and roots exposed for several weeks, if there is no danger from injury from cold, in order that the surrounding soil may be dried out. Treated trees should be inspected often for new outbreaks and attended to as soon as infection appears. County agents can aid you in your investigation and treatments. Write for additional information to the Florida Experiment Station, Gainesville.

CONTROLLING WOOLLY

WHITE-FLY ON CITRUS TREES

The woolly white fly seems to be unusually abundant just now. The larvae of this species is distinguished from other white flies by a conspicuous coat of curled, woolly wax. As these larvae always occur in colonies this wax is quite conspicuous.

A little wasp-like parasite is so common among these insects that it is seldom this species does serious

injury to a citrus grove. Because the woolly pupa cases cling to the leaves long after the insects have emerged or died, the grower usually overestimates the number of living larvae on his trees. Live larvae can be recognized by the presence of drops of honey dew among the woolly threads, by the dense growth of sooty mold which results, or by the many bees, wasps and flies which are attracted to the honey dew, says J. R. Watson, entomologist at the Florida experiment station.

The young larvae, before the heavy coating of wax develops, are easily killed by the same oil emulsions used against common citrus white fly. All the larvae are not in as favorable stage for spraying as they will be in late October. The spraying which should be applied now for the white fly will probably suffice to control this species also. Should it fail to do so, spray again in about six weeks.

A full description of this insect with illustrations, can be found in Bulletin 136 of the Florida Experiment Station, which will be mailed to you for the asking.

GUMPRECHT GIVES HIS ENDORSEMENT

Bradenton, Fla., Aug. 28.
Mr. S. L. Frisbie,

Editor Citrus Industry.

Dear Sir: Permit me to commend the article on "Co-Operative Production of Citrus" by D. W. Hadsell, which appeared in your August issue... It is splendid and supplies food for thought. No progressive grower can afford to overlook the points he makes. I have advocated association supervision for over five years. This should especially apply to small groves. In this way only can we hope to get better fruit, which means better markets and more money. In no other way can we eliminate the waste of energy, material and labor, the conservation of which is so essential at this time, to reduce the cost of production. It is the next step. It will and must follow. It is not the acreage planted, but the results obtained per tree, which counts.

Yours sincerely,
H. G. GUMPRECHT.

Fertilizers for Pineapples

By P. H. Rolfs

The present indications are that the pineapple is coming back, and will again be a profitable crop for farmers and growers in certain sections of Florida. Pineapple culture is confined most largely to a narrow strip of land along the east coast of Florida, although there are some fields at Punta Gorda and at Fort Myers. Larger or smaller plantations also occur in some of the islands and keys of the coast.

Experimental Results

All of the materials available for experimentation in the way of fertilizers for pineapples have been used by the experiment station and some very valuable data on the subject has been secured.

AMMONIA—Of the ammoniates used, their order of usefulness seems to range about as follows: Dried blood, blood and bone, cottonseed meal, castor pomace. All of these organic materials are quite acceptable to the pineapple plant. Where large quantities of cottonseed meal was used, it produced "spike" in the plants.

Nitrate of soda may be successfully used as a source of ammonia while the plants are young and there is little danger of getting the material in the axils of the leaves. It is quite caustic to the foliage and consequently somewhat difficult to apply.

Sulphate of ammonia should not be used, as this gave uniformly detrimental effects.

POTASH—The magnesium potassium carbonate gave best results in the form of potash. This form of potash, however, has been withdrawn from the market and is not recommended now.

The low grade sulphate of potash, or what is sometimes called double manure salts, also known as a potassium magnesium sulphate, gave almost as good results as the potassium magnesium sulphate. High grade sulphate of potash gave almost as good results as the low grade.

Kainit and muriate should not be used, as both of these gave detrimental results.

PHOSPHORIC ACID—Bone meal was one form of phosphoric acid that gave uniformly good results. Thomas' ag gave results nearly as good. Dissolved bone black when genuine can also be relied upon. Acid phos-

phate used by itself gave uniformly bad results, which were largely counteracted, however, when air-slaked lime to the amount of 750 pounds per acre was applied after the application of the fertilizer.

LIME—Various forms of lime, both in the carbonate and air-slaked form, were used on a small number of plants. No strikingly good effect was seen from its use.

Formulae

The formula which seemed to give best results under the experimental work for the growing pineapples, that is before they came into fruiting, was: Ammonia, 4 per cent; potash, 6 per cent; phosphorus, total, 6 per cent.

The formula that appeared to give best results for the fruiting crop ran: Ammonia, 5 per cent; potash, 10 per cent, and phosphorus total 5 per cent.

The experiments on fertilizers were completed at the time when potash could be obtained at about \$1 a unit. It is quite certain that with the present price a lower per cent of potash would prove to be more economical, but at the price of potash before the war the larger percentage seemed most satisfactory.

Amount of Fertilizer

The amount of fertilizer that can be profitably used will vary with its price and the price at which the crop can be sold. Taking the above formula as a basis, the most profitable amounts to use per acre range from 2,250 to 3,750 pounds annually. The number of applications of fertilizer which may be recommended is either three or four. The more frequent the applications, the less the loss through leaching; and if the intervals between fertilization are long, the plants are likely to suffer from lack of plant food at one time, and overfeeding at another.

Quality Affected by Fertilizer

Analyzes of a large number of fruits (Red Spanish), covering a period of four years, showed that the eating quality of the fruit is not affected by the kind of fertilizer used. The sugar content of the fruit is slightly increased by heavier fertilizer applications. The large fruits contain a greater percentage of sugar than the small ones, and a slightly smaller percentage of acid.

ANTHRACNOSE DEMANDS PROMPT ATTENTION

Anthracnose of citrus fruits is caused by the same fungus that causes withertip. Therefore, in groves where withertip is prevalent, anthracnose may be expected. The disease is manifested by dark colored, sunken patches in the skin of the fruit. The darkened spots may be regular or irregular in outline. The lesions may occur as a number of small pin-head spots, or they may involve a large portion of the fruit.

According to P. H. Rolfs, dean of the College of Agriculture, University of Florida, the first sign of the disease is dropping fruit. This is particularly true of grapefruit and to a lesser degree of tangerines and round oranges. The disease rarely appears on any of the fruits before coloring, except possibly on tangerines. Fruit on weak, poorly nourished trees is especially susceptible.

Ammoniacal solution of copper carbonate is recommended for control. The spraying must be prompt and thorough if it is to be effective. Every part of the fruit must be moistened, but not drenched. Inefficient spraying is useless. Keep the solution from the leaves and branches as much as possible. Repeat in ten days or two weeks. Results will show in about two weeks.

Rust Mites in Citrus Groves

Rust mites are beginning to appear in the citrus groves of the state, especially where no spraying has been done this spring. The heavy rains in some sections have done a great deal toward controlling this insect.

It would be a good idea for the grower to keep on the lookout for this pest and as soon as it appears remedial measures should be taken.

According to J. R. Watson, state experiment station, where groves have not been sprayed with oil emulsions this spray may be used for the white fly and scale insects. Some growers mix in some soluble sulphur and get the rust mite with the one spray. If the grove has already been sprayed for the scale and whitefly the proper spray to use for the rust mite is lime-sulphur, one part to seventy parts of water.

